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| 09/837,936 | 04/19/2001 | Dmitri Loguinov | 010209 | 8317 |

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EXAMINER

POLLACK, MELVIN H

ART UNIT PAPER NUMBER

2145

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 09/837,936 | Applicant(s) LOGUINOV ET AL. | |
| | Examiner Melvin H. Pollack | Art Unit 2145 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-10,12-15,18-24,26 and 27 is/are rejected.
- 7) ☒ Claim(s) 3,4,16,17 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. <u>06/16/2006</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>see attached office action</u> . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 April 2006 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 2, 5-10, 12-15, 18-24, 26, and 27 have been considered but are moot in view of the new ground(s) of rejection.
3. Applicant's arguments, see Page 12, filed 12 April 2006, with respect to claims 3, 4, 16, 17 and 25 have been fully considered and are persuasive. The rejections of claims 3, 4, 16, 17 and 25 have been withdrawn.
4. The remaining art rejections have been withdrawn in light of the amendment and remarks. New art will be applied in order to show the newly added limitations.
5. The claim 1 objection is withdrawn in light of the amendment.
6. In response to applicant's argument that Derby is not shown to be implemented in Sisalem (P. 11, lines 6-8), and that circumstances may arise regarding inefficiencies upon combination and under certain circumstances (P. 10, lines 11-14), the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would

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have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

7. In this case, both Sisalem and Derby teach methods and systems for estimating bandwidth and determining new bottleneck bandwidths, as shown in the Final Office Action dated 15 February 2006 (Paras. 11 and 12). In other words, it was never the intention of the examiner to attach the input of Derby to the output of Sisalem (or vice versa), but rather to incorporate Derby's superior algorithmic methods into Sisalem, which does not expressly detail the algorithmic methods of computing bandwidth samples. Applicant's have failed to show that such an incorporation would destroy the primary reference. Therefore, given proper motivation to combine, the combination is valid. In this case, the examiner clearly lays out that Derby expressly teaches modifications to Sisalem-like systems in order to solve an efficiency problem that Sisalem expressly discloses concern (Para. 12).

Allowable Subject Matter

8. Claims 3, 4, 16, 17 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

10. The following is a statement of reasons for the indication of allowable subject matter: the examiner has determined that the applicant is correct regarding the novelty and non-obviousness

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of the aforementioned claims, and specifically in considering OS delay in bandwidth estimation as described by the claims in independent form.

11. Claims 3, 16, and 25 teach a method and system for estimating a bottleneck bandwidth used to support estimation of the bottleneck bandwidth between a server and a client in a communication system. After computing bandwidth samples from received packets, using the claimed methods, the system filters out bandwidth samples encountering an operating system (OS) delay of said client system, along with samples having missing packets, before determining a new bottleneck bandwidth from the remaining samples.

12. Of the found art related to estimating bandwidth, the applicant has been unable to find art that considers packets or samples encountering OS delay as being statistically unreliable, let alone in need of filtering out. Nor is there any teaching of motivation to combine such a filter with the known art. Therefore, the combination is novel and non-obvious.

13. Claims 4 and 17 inherit the limitations of claims 3 and 16, respectively, and therefore are also allowable for the reasons above. In addition, claims 4 and 17 teach a specific formulation of determining whether OS delay occurs, and such formula is not present in art regarding OS delay or bandwidth estimation. Therefore, these claims in independent form would also be novel and non-obvious on their own merits.

Drawings

14. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because of informalities regarding line and lettering of Figs. 2-4(b). Furthermore, Fig. 5 has a block with a smudged background, making the lettering inside the block illegible. Applicant is advised to employ the services of a competent patent draftsman outside the

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Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1, 2, 5, 6, 9, 10, 12-15, 18, 21-24, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sisalem (Loss-Delay Adjustment Article) in view of Derby et al. (5,359,593) and Brown et al. (2005/0108420).

17. For claims 1, 12, 23, Sisalem teaches a method and system (abstract) for estimating a bottleneck bandwidth used to support estimation of the bottleneck bandwidth (Introduction) between a server and a client in a communication system (Fig. 1), the method comprising the steps of:

- a. Receiving at said client from said server a plurality of bursts comprised of packets (P. 5, section 3.1, esp. lines 28-34) transmitted from said server via a bottleneck link of said system (section 4.1);
- b. Computing a set of bandwidth samples from each of said bursts received by said client (P. 6, lines 3-14), wherein said bandwidth samples are computed based on an inter-packet spacing between a two packets within each of said bursts (bottleneck bandwidth spacing);

- c. Filtering out bandwidth samples from said set of bandwidth samples based on at least one characteristic of said received bursts, selected ones of said bandwidth samples (P. 6, lines 22-25); and
 - d. Determining a new bottleneck bandwidth from said filtered computed bandwidth samples, for transmission of subsequent data packets from said server to said client (P. 5, lines 11-16).
18. Sisalem does not expressly disclose a plurality of bursts comprised of at least three packets, nor computing bandwidth samples based on spacing between a first and last packet, but does disclose multiplicity of packets (P. 6, lines 15-21) and measurement between points (P. 8, lines 16-23). Derby teaches a dynamic bandwidth estimation method and system (abstract) for packet communications networks having steps of receiving at a client a plurality of bursts (col. 1, line 1 – col. 2, line 67) comprised of a series of large data packets [at least three packets] transmitted from said server via bottleneck link of the communication networks (Fig. 7 in view of col. 18, lines 21-24 and col. 19, lines 40-44); computing a set of bandwidth samples based on an inter-packet spacing between the first and the last packet within each of said bursts (col. 7, line 67 – col. 8, line 11); filtering from said set of bandwidth samples (col. 6, lines 58-67 in view of col. 18, lines 50-53), and determining a new bottleneck bandwidth (Fig. 4).
19. At the time the invention was made, one of ordinary skill in the art would have added Derby's dynamic bandwidth estimation methods in order to enhance QoS control methods (Sisalem; abstract). In large multicast groups in a heterogeneous environment, a "race to the bottom" can occur so that one poorly connected receiver determines the quality for the much larger number of well-connected receivers (Sisalem, P. 3, lines 1-8). Derby solves this problem

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by handling computed burst length samples and filtering same to insure that the filtered values are statistically reliable (Derby, col. 2, lines 38-41).

20. Sisalem and Derby do not expressly disclose rejecting bandwidth samples having a missing packet within a corresponding one of said bursts. Brown teaches a method and system (abstract) of providing dynamic detection of maximum (bottleneck) bandwidth between a client and a server (Paras. 1-107, 115), wherein only samples without missing packets are considered (Paras. 120-133 and 154-160). At the time the invention was made, one of ordinary skill in the art would have added this limitation to Sisalem in order to improve monitoring over a dynamic network (Para. 63).

21. For claims 2, 24, Sisalem teaches the method further comprising maintaining a bandwidth sample lifetime, wherein the step of filtering comprises the step of filtering bandwidth samples that have a sample life time greater than a threshold bandwidth lifetime (P. 6, lines 8-25 in view of P. 8, lines 16-23).

22. For claims 5, 18, 26, Sisalem teaches determining to reject a set of bandwidth samples by rejecting bandwidth samples having a retransmitted packet (P. 6, lines 15-25).

23. For claim 6, Sisalem teaches that the plurality of said packet bursts is transmitted at a maximum speed by said server system so that the inter-packet spacing is introduced in each of said bursts (P. 9, section 4.1).

24. For claims 9, 21, Sisalem teaches that the said new bandwidth corresponds to a minimum bandwidth of said computed bandwidth samples if a multi-channel link is deployed between said server and said client (P. 8, lines 5-23).

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25. For claims 10, 22, Sisalem teaches determining to reject a set of bandwidth samples by rejecting bandwidth samples having a missing packet within a corresponding one of said bursts (P. 6, lines 8-25).

26. For claim 13, Sisalem teaches that the step of computing said bandwidth samples comprises the steps of determining the start time and the end time of the reception of the first and the last packet within each of said bursts, but does not expressly disclose usage of packet size. Derby teaches determining the packet size of the second packet and the last packet for each of said bursts (Fig. 4), and computing said bandwidth samples based on a difference between the packet size of the second packet and the last packet, divided by an inter-packet spacing duration between the first and the last packet within each of said bursts (col. 7, line 67 – col. 8, line 11). At the time the invention was made, one of ordinary skill in the art would have added Derby's dynamic bandwidth estimation methods in order to enhance QoS control methods (Sisalem; abstract). In large multicast groups in a heterogeneous environment, a "race to the bottom" can occur so that one poorly connected receiver determines the quality for the much larger number of well-connected receivers (Sisalem, P. 3, lines 1-8). Derby solves this problem by handling computed burst length samples and filtering same to insure that the filtered values are statistically reliable (Derby, col. 2, lines 38-41).

27. For claim 14, Sisalem teaches that the plurality of said packet bursts is transmitted at a maximum rate by said server system so that the inter-packet spacing is introduced in each of said bursts (P. 9, section 4.1).

28. For claim 15, Sisalem teaches that the step of filtering said computed bandwidth samples comprises the step of filtering bandwidth samples having a sample life time greater than a

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threshold bandwidth lifetime (P. 6, lines 8 – 25; rejection of packets when SEQ > sequence number).

29. For claim 27, Sisalem does not expressly disclose rejecting bandwidth samples having a missing packet. Derby teaches this limitation (col. 7, line 67 – col. 8, line 11 in view of col. 20, lines 8-18). At the time the invention was made, one of ordinary skill in the art would have added Derby's dynamic bandwidth estimation methods in order to enhance QoS control methods (Sisalem; abstract). In large multicast groups in a heterogeneous environment, a "race to the bottom" can occur so that one poorly connected receiver determines the quality for the much larger number of well-connected receivers (Sisalem, P. 3, lines 1-8). Derby solves this problem by handling computed burst length samples and filtering same to insure that the filtered values are statistically reliable (Derby, col. 2, lines 38-41).

30. Claims 7, 8, 19, 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sisalem and Derby as applied to claims 1, 12, and 23 above, and further in view of Berthaud (5,815,492).

31. For claims 7, 19, Sisalem in view of Derby does not expressly disclose that said new bandwidth corresponds to a median value of said computed bandwidth samples for a low speed link. Berthaud teaches this limitation (col. 9, lines 5-34 in view of col. 13, line 45 – col. 14, line 18). At the time the invention was made, one of ordinary skill in the art would have added Berthaud's OS delay filtering mechanism to Sisalem and Derby in order to further increase the rejection of samples that act as "noise" and therefore may cause the estimation to be statistically unreliable (abstract), since, in order to successfully control traffic access, it is necessary to

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accurately characterize the traffic so as to provide appropriate bandwidth for traffic carrying (col. 3, lines 8-18).

32. For claims 8, 20, Sisalem in view of Derby does not expressly disclose that said new bandwidth corresponds to the statistical mode of said computed bandwidth samples for a high speed link. Berthaud teaches this limitation (col. 13, line 46 – col. 14, line 18).

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. They regard further teachings of bandwidth estimation and OS delay.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin H. Pollack whose telephone number is (571) 272-3887. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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MHP

19 June 2006

Melvin H. Pollack
AU 2145

Melvin H. Pollack